# HUMAN-LION CONFLICT TOOL KIT

# CONTRIBUTING PROJECTS

African People & Wildlife Fund
BornFree Foundation
Cheetah Conservation Botswana
Cheetah Conservation Fund, Namibia
Ecole de Faune, Garoua
Ewaso Lions
Lion Guardians
Living with Lions
Matusadona Lion Project
National Geographic, Big Cats Initiative
Niassa Carnivore Project
Niassa Reserve
Panthera
Reseau Ouest et Centre Africain pour la conservation du Lion (ROCAL)
Ruaha Carnivore Project
Rufiji Man-Eating Project
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Funded by: Niassa Carnivore Project
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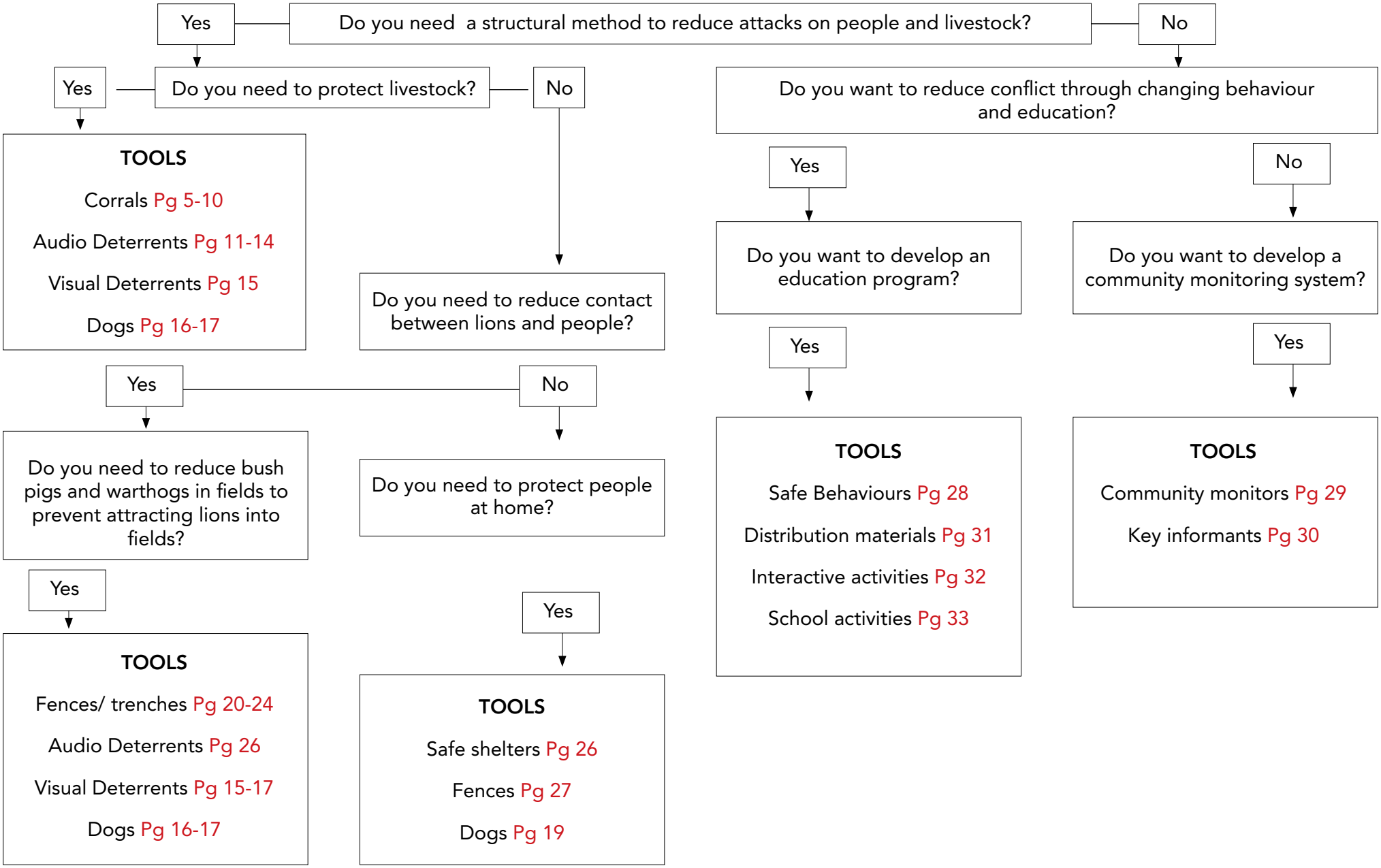
# TOOLS TO REDUCE CONFLICT BETWEEN PEOPLE AND LIONS



# PURPOSE OF THIS TOOL KIT

The African lion is in crisis, with only 35,000 lions left on the continent and human-lion conflict has been identified as a major threat where lions coexist with people. Lion attacks across the region cause significant loss of life and livelihoods and result in retaliatory killings of lions by local communities and a lack of political and local will for lion conservation.

This toolkit is the result of an initial two day workshop on "Finding solutions to human-lion conflict" that was held in Dar es Salaam in 2010 and ongoing collaboration with lion conservationists. Researchers and extension workers representing lion conservation projects across the region collated and distilled their collective knowledge and experience into a detailed table of more than 30 "tools" to reduce human-lion conflict that have shown some success. These are updated as and when necessary based on new information available.

Here these "tools" are placed in one toolkit with basic details on how to use them, and their relative effectiveness and cost. There are no quick fixes and it is unlikely that any one technique will provide the perfect solution. Rather a unique suite of tools will need to be developed for each area that takes into account environmental conditions, funding, access to outside materials, and the level of conflict. There is no doubt that extension work and community involvement is a critical element of success for all techniques. With this toolkit in hand you should be able to make the decision about the most appropriate methods to use in your particular situation and have all the information you need to implement that solution including contact details of projects with experience using that particular tool.

Like a real toolkit, additional "tools" will be added as they become available and old tools will be tested, refined and if necessary discarded as further testing is done. This is intended as an adaptive, collaborative manual that will facilitate the scaling up and testing of methods to reduce human-lion conflict across study sites and populations based on what we have learned so far.

# HOW TO USE THE TOOLKIT

## Distribution and printing

1. The toolkit is provided as a pdf file for easy distribution. Please feel free to distribute freely.
2. Each project could print out a field copy, laminate the pages and ring bind with cardboard backing for strength so that it can be used in the field.
3. In the pdf document is a lined writing page to be inserted into the printed out copy (not laminated) for field notes, tests of a particular technique and comments. These can be scanned and returned to the editors.

## Use of the toolkit

1. Instead of an index the toolkit has a decision tree to lead you to the tool that might be the most useful for your use.
2. Each tool is on a separate page with information on the cost, amount of external input required, effectiveness, and photographs where appropriate.
3. For each tool a code for the conservation projects using that technique are presented. The key for these codes is at the end of the toolkit with contact details if you need more information.

# ACACIA / THORN CORRALS

## DESCRIPTION

*Adaptation of traditional cattle corrals to make them more effective at preventing lions and other carnivores from entering. Used for all livestock.*

## IMPORTANT ELEMENTS

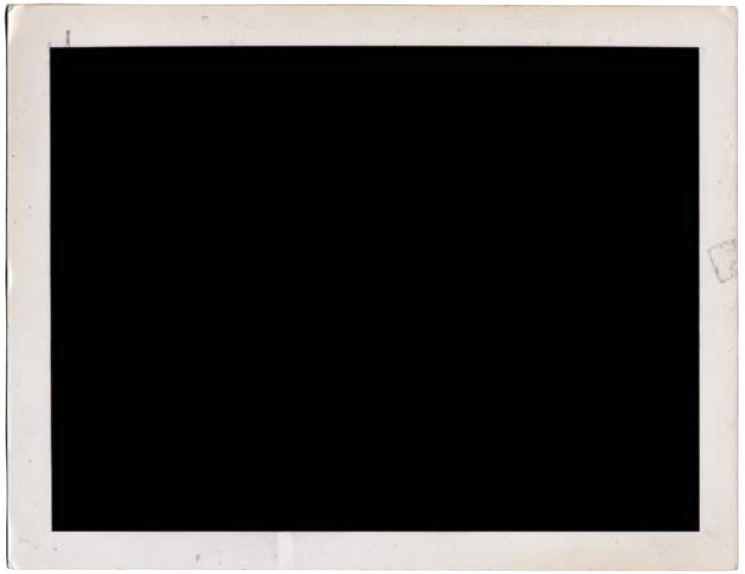
- Few partitions and few entrances
- Need both inner and outer walls
- Stems facing in so that carnivores cannot climb up the outside
- Walls have to be very thick to prevent panicking livestock breaking out and high enough to stop carnivores from jumping in.
- Gates need to be as strong as the walls and can be made of a different construction material.
- Should not be built near landscape features that facilitate a carnivore's approach (thick bush or rocks) or entry into the boma (e.g. a large tree).
- Can be reinforced using chain-linked fencing.

## EFFECTIVENESS/PROS

- Not a new technique rather an adaptation of traditional style corrals used by many pastoralists.
- Very effective if done correctly
- Uses local materials

## LIMITATIONS TO APPLICABILITY/CONS

- Bush needed to build corrals, can only work well in woodland or wooded savannas areas containing thorn trees.
- Require extensive and frequent maintenance
- Collection of bush can cause habitat degradation through deforestation
- Not movable so can lead to habitat degradation around corrals



*Acacia Thornbush Corral © Living with Lions*

## MONETARY COST

None

## EXTERNAL INPUT NEEDED

None – uses traditional knowledge

## PROJECTS USING THE METHOD

LG, LWL, RCP, APW

# STONE CORRALS

## DESCRIPTION
*Corrals build of local stones or locally made clay bricks. Used primarily for cattle.*

## IMPORTANT ELEMENTS
- Made from stones collected in the area
- Expertise required in dry stone walling techniques
- Must plant Acacia species on top or use thorn brush on top to prevent predators from climbing over
- Gate is the weakest point and can let down the whole structure if not well built.

## EFFECTIVENESS/PROS
- Very effective
- Cheap if enough local stone can be collected
- Much less local tree/bush cutting required and can be eliminated completely if walls are built thick enough to fill top section with earth and plant living walls e.g. Acacia species
- Very durable

## LIMITATIONS TO APPLICABILITY/CONS
- Not movable so can lead to habitat degradation around corrals through overgrazing
- Only possible in areas where stone is available and plentiful
- Time and labor intensive to build

## COST
- None
- Labor to collect and build

## EXTERNAL INPUT NEEDED
None – local products and knowledge

## PROJECTS USING THE METHOD
LWL

Stone Corrals © Living with Lions

# CHAIN LINKED FENCE CORRALS

## DESCRIPTION

*These reinforced corrals are constructed with poles and chain link fences. Used for all livestock.*

## IMPORTANT ELEMENTS

- Distance between poles – the shorter the better
- Gauge of fence – 2mm or greater
- Types of poles – either purchased treated poles or locally collected poles
- Thorn bushes should be placed on the inside of the fence to prevent livestock from leaning against the chain link.
- Fence dug into the ground at least 6 cm

## EFFECTIVENESS/PROS

- Very effective
- Requires education about maintenance
- Treated poles last 2-3 years
- Local poles have no cost

Chain Linked Fence Corrals

All images © Tarangire Lion Project

- Key material i.e. chain link and poles are movable with some effort
- Reduces the amount of bush cut and can be used in areas where thorn trees are not plentiful.

## LIMITATIONS TO APPLICABILITY / CONS

- Cannot be used in some areas because of the use of fencing for snares
- Require significant resources
- Termites reduce longevity of fence poles. Can try to use plastic bags/ cement for the bottom parts of the poles and termicide
- Purchased poles can be expensive
- Local poles need to be collected
- Not easily movable if poles are set in cement so can lead to habitat degradation around corrals

Chain Linked bomas made from metal gates

## COST

TLP – $90 per fence role, $7 per treated pole, $200 – $900 per corral

## EXTERNAL INPUT NEEDED

- Materials – Poles, Fencing, Nails
- Expertise
- Transportation needed to bring in materials

Metal gate corral with stakes

## PROJECTS USING THE METHOD

LWL, TLP

# LIVING WALL CORRALS

## DESCRIPTION

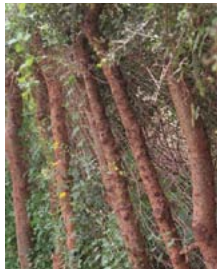
*Similar to chain link fence corrals but uses live trees instead of poles as fence posts. Used for all livestock.*

## IMPORTANT ELEMENTS

- Distance between poles is 0.5m
- Gauge of fence is 2 mm or greater
- Types of poles – Commiphora africana (although other types of trees may work)
- Thorn bushes should be placed 0.5m from the inside of the fence to keep manure and urea away from the trees to prevent root rot until trees have established.
- Fence should be dug underground (about 20–25 cm) and staked in with wooden stakes
- C. Africana poles cut in dry season and dried until sap forms on ends, this takes a minimum of one week but the longer the better, best if sap is dried hard.
- Plant into dry soil, should not get moisture until it sprouts.
- New growth is woven back through the chain link to complete the living wall and top sprouts grow upwards to add height.

## EFFECTIVENESS/PROS

- Very effective
- No need to replace poles, requires little maintenance.
- C. Africana is thorny and provides added protection for livestock and is both drought and termite resistant.
- Promotes habitat protection by reducing the need to cut down Acacia thorn for boma construction



## LIMITATIONS TO APPLICABILITY/CONS

- C. africana is widespread throughout East and Southern Africa but other locally available species may need to be used.
- In some areas fencing might be used for snares but this can be prevented by ensuring the owner has a financial investment in the "Living Wall" and/ or is under contract for the upkeep of corral and cannot disassemble.
- Requires significant initial investment for fencing

## COST

- Estimated at $4 per meter for fencing, average $500 per corral, cost shared with owner of corral.

## EXTERNAL INPUT NEEDED

- Materials – chain link, nails and hammer
- Initial expertise
- Transportation needed to bring in materials

## PROJECTS USING THIS METHOD

APW

# MANUFACTURED MOBILE CORRALS

## DESCRIPTION

*This is a manufactured product that can be purchased to protect cattle. It is most frequently used on commercial ranches. It is made from a set of inter linking gates staked into the ground.*

## IMPORTANT ELEMENTS

- Not applicable – product is manufactured and the important elements are included in manufacturing

## EFFECTIVENESS/PROS

- Very effective
- Can last indefinitely if metal is treated for rust and welding maintained
- Requires little maintenance
- Allows for rotation of stock
- Costs could be shared by a community
- No natural resources are needed
- No local tree/bush cutting is required
- Can be used to improve degraded areas as part of a rangeland management program
- Can be moved easily within a local area by opening rotating and reforming around a single point in the wall (creeping)

## LIMITATIONS TO APPLICABILITY/ CONS

- High initial cost outlay may be prohibitive but cost effective over the long term.
- Heavy and  hard to move over a longer distance without a vehicle and trailer

## COST

- Approximately $2000

*Metal gate corral with stakes*

*Chain Linked bomas made from metal gates*

## EXTERNAL INPUT NEEDED

- Needs to be purchased or manufactured
- Requires vehicle to move to a completely new location.

## PROJECTS USING THE METHOD

LWL

# LOG CORRALS

## DESCRIPTION
*Small corrals built of logs to protect small herds of small livestock like goats and sheep.*

## IMPORTANT ELEMENTS
- Double wall if possible, a minimum of 0.5m apart
- Poles should be wide and strong
- Minimize gaps between poles (reduce the ability to see in)
- Roof is a weak point and thatch is not recommended, must be strong enough to prevent carnivore climbing in.
- Must keep the animals in when they panic

## EFFECTIVENESS/PROS
- Very effective as long as it is well maintained.
- Different local designs are already in use

Strong goat corral but thatch is a weak point
© Niassa Carnivore Project

Log Corrals © Niassa Carnivore Project

## LIMITATIONS TO APPLICABILITY/CONS
Only useful in woodland areas where poles are available

## COST
- None
- Time and labor

## EXTERNAL INPUT NEEDED
Some guidance may be needed to ensure they are effective.

## PROJECTS USING THE METHOD
NCP, NR

# SHOUTING

## DESCRIPTION
*People yelling and shouting when a carnivore approaches to chase it off*

## IMPORTANT ELEMENTS
- Livestock need to be near to people
- Lions need to be afraid of people for this to work as a deterrant
- Shouting should sound aggressive rather than distressed otherwise it might attract the lions
- Usually used in combination with other deterrents such as torches

## EFFECTIVENESS/PROS
- Effective in areas where lions have learnt to be afraid of people.
- Can scare lions away if they are close and if shouting is sufficiently aggressive
- Always on hand in the absence of other noisemakers

## LIMITATIONS TO APPLICABILITY/CONS
- Reactive- need to see animal
- Animals must be afraid of people
- Can attract lions into areas where lions are not afraid of people or where shouting sounds like a distress call
- Reactive not proactive
- Brings people into close contact with lions

## COST
None

## EXTERNAL INPUT NEEDED
None

## PROJECTS USING THE METHOD
LWL

# WARNING SHOTS

## DESCRIPTION
*Warning shots fired from a gun to scare away animal*

## IMPORTANT ELEMENTS
Must have a gun

## EFFECTIVENESS/PROS
- Immediate response
- Especially effective in hunting areas or in areas where lions have been shot at before.

## LIMITATIONS TO APPLICABILITY/CONS
- Need to be alert when animal approaches
- Animals could get acclimated
- Need necessary permits/ license and expertise to have and use a firearm.
- Gun ownership can be difficult in some countries

## COST
- Variable – gun and ammunition

## EXTERNAL INPUT NEEDED
- Purchase of gun and ammunition
- Skill to fire weapon
- Arms permit / license

## PROJECTS USING THE METHOD
LWL

# HOMEMADE NOISE MAKERS

## DESCRIPTION
*A variety of home-made noisemakers are used to scare away lions*

## IMPORTANT ELEMENTS
- Must make a loud noise
- Empty jerry cans on poles in the middle of a corral which causes livestock to make a noise when a carnivore approaches
- Dust pan lids or metal sheets
- Metal sheet

## EFFECTIVENESS/PROS
- Effectiveness is unknown
- They provide an immediate response

## LIMITATIONS TO APPLICABILITY/CONS
- Only works when an animal approaches
- Animals could get acclimated to the sounds

## COST
- Depends on type but generally low cost made from available materials
- Materials usually locally available

## EXTERNAL INPUT NEEDED
None

## PROJECTS USING THE METHOD
LG, RCP

*A jerry can on a stick inside a cattle corral © Ruaha Carnivore Project*

# COMMERCIAL NOISE MAKERS

## DESCRIPTION
*Commercially made noisemakers such as stadium horns ( e.g. vuvuzela) are used to scare off lions when they are seen*

## IMPORTANT ELEMENTS
- Waterproof and durable
- No batteries or replaceable parts
- Cheap
- Cannot sound like a distress call

## EFFECTIVENESS/PROS
- Effective with carnivores for a short period
- Delivers an immediate response

## LIMITATIONS TO APPLICABILITY/CONS
- Reactive – need to be aware when animal approaches
- Animals could get acclimated
- People need to be in close contact with the lions

## COST
- Variable but generally under $10

## EXTERNAL INPUT NEEDED
Purchase of noise maker

## PROJECTS USING THE METHOD
RCP

Commercial noise makers: A pastoralist with a small blue stadium horn © Ruaha Carnivore Project

# BELLS

## DESCRIPTION
*Bells hung around the neck of livestock usually cattle.*

## IMPORTANT ELEMENTS
About one bell for every four livestock animals

## EFFECTIVENESS/PROS
- Assists herders in finding livestock
- Has potential to scare lions away if they are afraid of people
- Assists herders in knowing when lions may be present due to noise of bells
- Helps to keep the herd together

## LIMITATIONS TO APPLICABILITY/CONS
- Lions can get acclimated and/or attracted to bells so negative association needs to be reinforced with good herding practice.
- This is more a method to assist herders that protect livestock

## COST
- None - mostly homemade, can use tin cans or pipes

## EXTERNAL INPUT NEEDED
None

## PROJECTS USING THE METHOD
LWL

# VISUAL DETERRENTS

**Flashlights, Lanterns, Fires, Scarecrows, Fake Animals, Umbrellas**

## DESCRIPTION

*Any number of visual deterrents can be useful for scaring away wild animals (carnivores and bushpigs).*

## IMPORTANT ELEMENTS

The item must be unusual or suggest a human is near to scare the animal away.

## EFFECTIVENESS/PROS

- Potential immediate reaction

## LIMITATIONS TO APPLICABILITY/CONS

- Needs to be unfamiliar to the animal for it to work.
- Animals quickly become habituated so constant change is necessary for it to be effective
- Only works when an animal is within sighting distance
- Some types dependent on batteries that are not easily available and are expensive

## COST

- Dependent on type
- Can be very cheap but may require continuous purchase of batteries

## EXTERNAL INPUT NEEDED

Dependent on type, could require equipment of batteries

## PROJECTS USING THE METHOD

LG, LWL, NR, RCP

A commercial flashing light to deter animals © Rufiji man-eating project

Scarecrow inside cattle Boma © Ruaha Carnivore Project

Homemade leopard scarecrow used to scare off bushpigs © Niassa Carnivore Project

# COMMERCIAL LIGHTS

Variety of commercial varieties

## DESCRIPTION

*A flashing light system that confuses lions when they come close to livestock enclosures/corrals/ bomas. This includes a variety of commercial produced lights including the "lion lights" invented by Richard Turere, a 13 year old Kenyan, to keep lions away from his corral. He used the knowledge that lions were scared of people carrying torches to rig up a series of automated flashing LED light bulbs that gave the impression of continued human activity around a livestock enclosure. These "lion lights" have since been fine-tuned, commercialized and scaled up. Each requires specific set ups and research is recommended prior to installation. Other varieties in use include Niteguard (www.niteguard.com); Predator Guard www.predatorguard.com) and Fox lights (www.foxlights.com). Some lights mimic eye shine to scare away predators.*

Homebrite © Ewaso Lions

Niteguard © Ewaso Lions

## IMPORTANT ELEMENTS

- Lights must provide coverage of all sides of the livestock corral. Multiple lights are needed for large corrals or livestock enclosure.
- Need to be installed in a way that prevents livestock from chewing on the wire/bulbs or stepping on it.
- Battery needs to be fully charged to be effective for the whole night
- Lights must be oriented correctly. In most cases this means facing out from the corral.
- Lights need to be installed on both sides of the corral entrance which is often the weakest point.
- Placing lights as high as possible on mounting poles is better, as the light can be seen from further away so there is better coverage.
- Each light has its own specifications for effective use. Follow the instructions by the manufacturer.

## EFFECTIVENESS/PROS

- Seem to be effective when set up correctly with all components working properly and full coverage but different lights have different success rates and this requires more research.
- Effective for people who are moving around – as lights are portable. Especially effective at night when people arrive at a location late in the day.
- Should only be used in conjunction with a well-designed corral .

## LIMITATIONS TO APPLICABILITY/CONS

- For some models that are not solar powered, providing batteries may be a problem.

# COMMERCIAL LIGHTS

- The best systems are compact and an all-in-one unit to prevent theft of parts for other uses.
- Some require regular maintenance for solar panels, bulbs and wires.
- Possible habituation of lions to the lights.
- Possible disturbance to people when corrals are close to houses and lights are on all night.
- High cost for local people and require outside assistance to order and buy them.
- Only applicable when livestock is kept at corrals and not during daytime herding.
- Limited coverage for especially large corrals.
- Lights will not stop livestock breaking out if they smell a predator and so livestock corralwalls still need to be strong i.e. lights are only effective in addition to strong corrals, not as a substitute.

## COST

- Varies from $20 / unit for the smaller compact units to $300 per unit (lion lights and fox lights).

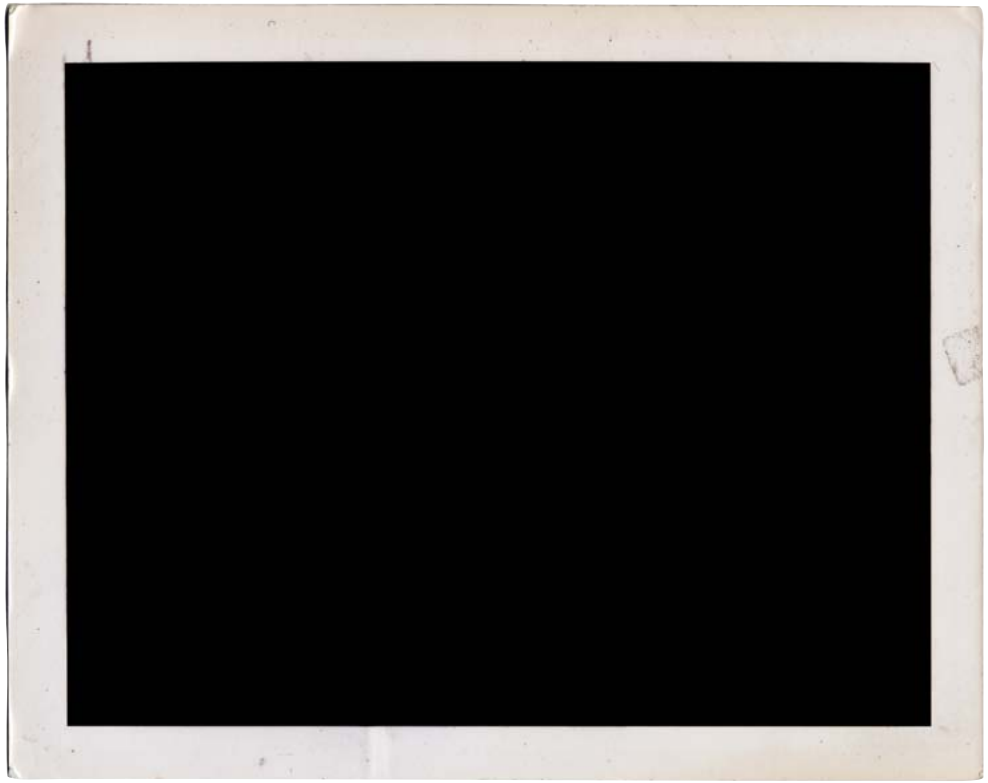
## EXTERNAL INPUT NEEDED

- Mounting poles.
- Expertise on how to set them up.
- Assistance with ordering, transporting them to study site.

## PROJECTS USING THE METHOD

EL, LG, NCP, RCP, and others

*Lion lights © Ewaso Lions*



*Lion lights © Ewaso Lions*

# WATCH DOGS/HERDING DOGS

## DESCRIPTION
*Local dogs used in pastures, corrals, homes as a warning system to let people know when wild carnivores are present.*

## IMPORTANT ELEMENTS
- Dogs need to be well fed but feel vulnerable to predation themselves in order to be alert

## EFFECTIVENESS/PROS
- Can be useful as an early warning system when wild carnivores are in the area

## LIMITATIONS TO APPLICABILITY/CONS
- Problems with disease transmission to wild animals therefore must be vaccinated
- Can attract lions, leopards and hyaenas into villages as they are eaten as prey
- Can be used for illegal hunting
- Need to be fed
- May not be culturally appropriate
- Reactive

## COST
- None for the dog itself if local dogs are used but vaccinations and food for the dog can be a significant cost.

## EXTERNAL INPUT NEEDED
Vaccination, assistance with training

## PROJECTS USING THIS METHOD
LWL, RCP, APW

*Dogs kept as warning system © Ruaha Carnivore Project*

# GUARDING DOGS

## DESCRIPTION
*Specially trained and bred dogs used to guard and gather herds*

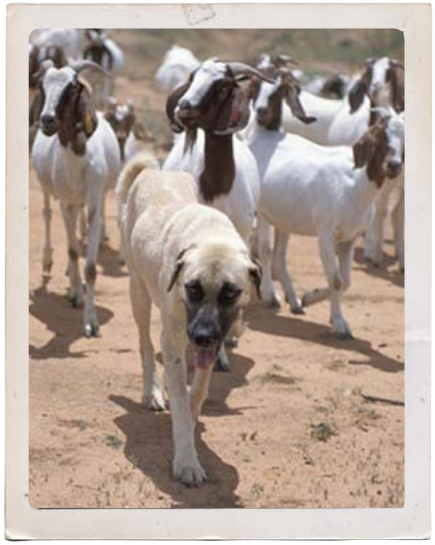
## IMPORTANT ELEMENTS
- Need to be well fed
- Need to be trained and bonded with people

## EFFECTIVENESS/PROS
- Useful as a herding dogs to keep livestock together and bring them to back to the corrals
- Barking warns of predator close by
- Effective at chasing off medium to small predators (cheetah, leopard, jackal) through barking and posturing.

## LIMITATIONS TO APPLICABILITY/CONS
- Unlikely to be as effective at chasing off lions; needs to be tested
- Specialized breed requires purchase and proper training, however, local dogs can also be used
- Cost may be prohibitive is specialised breed
- In areas with tsetse fly dogs may be killed by trypaniasomiasis

## COST
- Substantial for health care and food, cost of purchasing and training dog

## EXTERNAL INPUT NEEDED
- Dog
- Training
- Veterinary care



Livestock guarding dog
© Cheetah Conservation Fund, Namibia

Local dogs trained as guard dogs
© Cheetah Conservation Botswana

## PROJECTS USING THE METHOD
Cheetah Conservation Fund-Namibia
Cheetah Conservation Botswana

# LIVING FENCES

## DESCRIPTION
*Fences using live plants (hedge) to protect crops against bush pigs*

## IMPORTANT ELEMENTS
- Commiphora africana is the preferred plant species but other local species might also work (Euphorbia sp.)
- Cuttings should be thicker than your thumb and longer than forearm.
- Planted in a criss cross way to prevent holes at base
- Double line of cuttings planted to ensure thick hedge development
- Cuttings should be cut at the peak of dry season (can sit unplanted for a two weeks)
- Plant into dry soil a few weeks before the first rains otherwise will rot
- Wind new growth back into hedge and cut off terminal shoots to encourage branching
- No water necessary
- Replace cuttings that don't coppice to reduce holes

## EFFECTIVENESS/PROS
- Termite proof and fire resistant
- Forms a physical long lasting barrier
- Not invasive
- Established fence can be used for cuttings for new fences

## LIMITATIONS TO APPLICABILITY/CONS
- C.africana cannot be found everywhere, may need to adapt based plants available and environmental conditions
- Not an immediate solution, requires at least two growing seasons to become established.
- Cannot easily be removed
- Weeding around cuttings needed in first few years.

*Example of an established fence © Niassa Carnivore Project*

*Planting living fence cuttings © Niassa Carnivore Project*

- Does not grow well in areas that are flooded in wet season
- Farmers are reluctant to wait 3 growing seasons for an effective fence

## COST
- None or low initially, may need to purchase cuttings and transport them to study area to start

## EXTERNAL INPUT NEEDED
- Initial cuttings may need to be brought into fields
- Requires some guidance on planting and initial maintenance to ensure fence is effective.

## PROJECTS USING THIS METHOD
NCP, NR

# BAMBOO FENCES

## DESCRIPTION
*Fencing made of bamboo poles used to protect crops from bush pigs*

## IMPORTANT ELEMENTS
- One meter high
- Lattice fence
- Natural bark rope to tie poles together

## EFFECTIVENESS/PROS
- Very effective for small plots as long as it is maintained
- Could be used in cooperatives

## LIMITATIONS TO APPLICABILITY/CONS
- Not sustainable if harvesting bamboo from the wild
- Labor intensive
- Only useful for small plots
- Only lasts one season; susceptible to termite and fire damage

## COST
- Minimal, time and labor,  bamboo might need to be purchased

## EXTERNAL INPUT NEEDED
None – traditional fence

## PROJECTS USING THE METHOD
NCP, NR

Traditional Bamboo fences © Niassa Carnivore Project

# POLE FENCES

## DESCRIPTION
*Fence made of wood poles*

## IMPORTANT ELEMENTS
- Vertical poles should be placed every 30 cm, should be buried 30 cm into the soil and should stand one meter high
- Four poles should be placed horizontally evenly spaced
- Nails to secure poles together

## EFFECTIVENESS/PROS
- Effective in places where proper poles are available and for small plots
- Depending on type of pole can last for 3-5 years,

## LIMITATIONS TO APPLICABILITY/CONS
- Not sustainable if harvesting poles from the wild
- Labor intensive
- Requires nails

## COST
- Low
- Time and labor
- Nails

## EXTERNAL INPUT NEEDED
Traditional fencing but does require help to acquire nails

## PROJECTS USING THE METHOD
RME

*Pole fences used to keep out bushpig © Rufiji Man-eating Project*

# LOG FENCES

## DESCRIPTION
*Fence made of logs placed close together, no cross bars*

## IMPORTANT ELEMENTS
Vertical poles should be placed close together with no more than 10 cm between poles, buried 30 cm into the soil and should stand one meter high

## EFFECTIVENESS/PROS
- Effective in woodland areas where proper poles are available and for small plots
- Depending on type of pole can last for 3-5 years.
- No external material needed

## LIMITATIONS TO APPLICABILITY/CONS
- Not sustainable if harvesting poles from the wild
- Labor intensive

## COST
- Low
- Time and labor

## EXTERNAL INPUT NEEDED
None, Traditional fencing

## PROJECTS USING THE METHOD
NCP

*Traditional Log fences © Niassa Carnivore Project*

# TRENCHES

## DESCRIPTION
*Trenches dug around plots to protect crops from bush pigs*

## IMPORTANT ELEMENTS
- 1.5 meter deep on vertical slope adjacent to crops
- 2 meter on gradual slope opposite crops to allow pigs to climb out
- 2 meters wide
- First layer of soil can go in plot
- Deep soil should go outside of plot

## EFFECTIVENESS/PROS
- Very effective for small plots in proper soil types and terrains
- Added benefit of keeping moisture in the soil
- No technical input needed

## LIMITATIONS TO APPLICABILITY/CONS
- Can only work in clay soil or loam soil
- Will not work in sand soil
- Requires maintenance seasonally
- Works for small to medium animals
- Does not work in very wet areas
- Very labor and time intensive (ex. Twenty people, two weeks, 25x25)

## COST
- Very labor and time intensive
- May need to purchase equipment
- Low

Trenches © Rubigi Man-eating Project

## EXTERNAL INPUT NEEDED
May need to bring in shovels and hoes

## PROJECTS USING THE METHOD
RME

# NOISE MAKERS

## DESCRIPTION

*Used as a method to deter bush pigs from entering crops and to warn people of bush pig presence*

## IMPORTANT ELEMENTS

- Cans made with flat aluminum sheets (half meter high, quarter meter wide)
- 5-inch nails hanging inside to make noise
- One for every 25 meters
- Hang on poles by binding wires
- Binding wires around plot
- Wires must be tight

## EFFECTIVENESS/PROS

- Works well to scare pigs and warn people of their presence if maintained properly
- Could use locally produced noisemakers which would require less input and cost

## LIMITATIONS TO APPLICABILITY/CONS

- Habituation could be a problem
- Needs to be maintained or will not work
- Currently testing noisemakers that require outside input

## COST

- Low
- $10-$15 per noise maker
- Binding wire

Homemade Noisemaker © Rubigi Man-eating Project

## EXTERNAL INPUT NEEDED

- Materials need to be purchased
- Technical knowledge for making them

## PROJECTS USING THE METHOD

RME

# SAFE SHELTERS

## DESCRIPTION

*People are vulnerable when sleeping. Building of stronger traditional houses in villages and seasonal huts in agricultural fields to make sure that when people are sleeping they are safe from attacks.*

## IMPORTANT ELEMENTS

- Must have strong walls, door and roof
- Roof must be well maintained with no holes or gap between walls and roof
- Thatch, bamboo and grass walls are discouraged
- Closable door and windows with bars or shutters
- Huts off the ground on stilts in fields are encouraged

## EFFECTIVENESS/PROS

- Effective to prevent contact with lions

## LIMITATIONS TO APPLICABILITY/CONS

- Time and effort needed to build safe shelters particular in fields where people typically sleep in simple shelters or outside

## COST

- Materials and labor

## EXTERNAL INPUT NEEDED

None – just stronger traditional homes

## PROJECTS USING THE METHOD

NCP, NR

Shelters on stilts are effective against lion attacks

© All images Niassa Carnivore Project

Safe shelter made with thick log walls used in field in the wet season

# FENCING

DESCRIPTION
*Fencing to enclose peoples' cooking areas and outdoor toilets to limit the chance of lions coming across people*

IMPORTANT ELEMENTS
- Can be made from poles, living fences (see page 17) or bamboo
- Should protect cooking area and outdoor toilet
- Should prevent lions from seeing people
- No holes and well maintained
- At least 2m high

EFFECTIVENESS/PROS
- Effective to prevents contact with lions

LIMITATIONS TO APPLICABILITY/CONS
- Time and effort needed to build

COST
- Low (depends on materials)
- Materials and labor

EXTERNAL INPUT NEEDED
None – just stronger traditional homes

PROJECTS USING THE METHOD
NCP, NR

# OUTDOOR TOILETS & BATHING AREAS

DESCRIPTION
*Well constructed outdoor toilets and bathing areas to limit the chance of lions coming across people*

IMPORTANT ELEMENTS
- Must have proper walls and door
- No holes in wall or door
- Safe pathway to toilet from home

EFFECTIVENESS/PROS
- Effective to prevent contact with lions

LIMITATIONS TO APPLICABILITY/CONS
- Time and effort to build

COST
- Depends on materials and labor

EXTERNAL INPUT NEEDED
None – just stronger traditional homes

PROJECTS USING THE METHOD
NCP

# SAFE BEHAVIOURS

## DESCRIPTION

*There are a variety of things people can do to reduce contact with lions, reduce habituation, reduce attracting lions, and makes people less vulnerable such as:*

- No walking alone in the bush
- Limited walking around away from the homestead after dark or in the early morning
- No children walking alone
- Children close to with an adult at dawn and dusk
- Using flashlights/lanterns
- No sleeping outside, sleep in a shelter with a door and roof
- Safer drinking practices
- Proper waste disposal to avoid attracting carnivores to the homestead
- Proper hydration & nutrition
- Use safe washing and toilet facilities after dark (see section on fences)
- No snaring around human dominated areas or along paths as snared animals attract lions

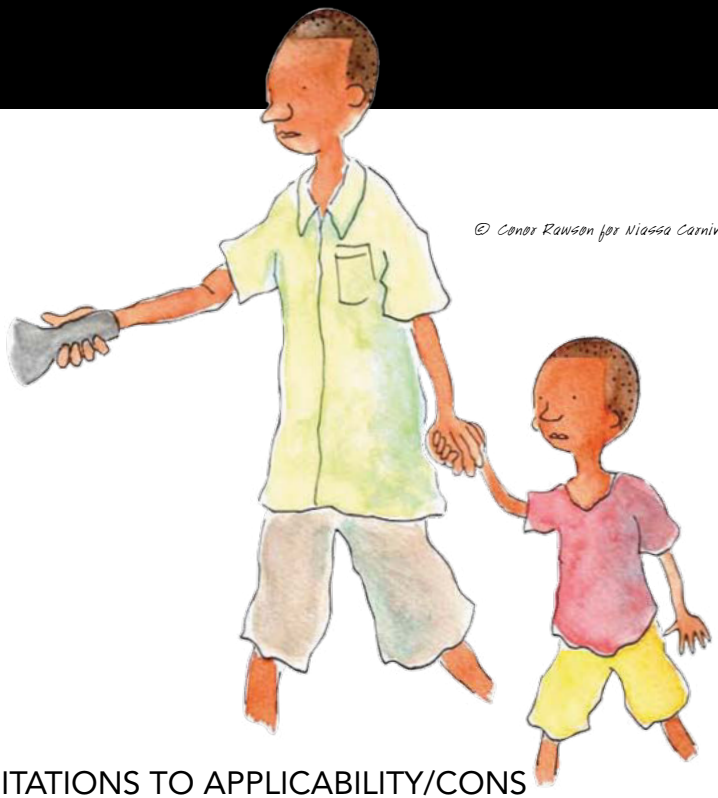
If risky practices must be undertaken then avoid a routine that might be learned by lion and/or mitigate risks with other practices. For examples don't collect water at the same spot every day very early in the morning or late evening. If you must collect water in this way then go in a group, not alone.

## IMPORTANT ELEMENTS

Emphasis on taking responsibility for your own safety

## EFFECTIVENESS/PROS

- Reduces risk of lion attack
- Proactive



© Conor Rawson for Niassa Carnivore project

## LIMITATIONS TO APPLICABILITY/CONS

- Reluctance to change set behaviours before a lion attack occurs
- Cultural sensitivities may limit applicability
- Needs ongoing extension work

## COST

None

## EXTERNAL INPUT NEEDED

Extension work to promote safe behaviours

## PROJECTS USING THE METHOD

LG, LWL, NCP, NR, RCP, RME, TLP, APW

# MONITORING & EXTENSION

## DESCRIPTION

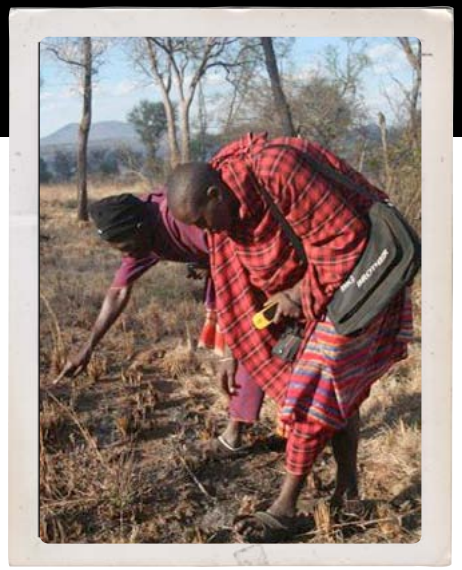
*This involves hiring community members to monitor and assist with various aspects of managing conflict including recording information (conflict events, lion presence, snaring, movements), preventing retaliatory lion killing, advising and assisting with practical methods to reduce attacks (e.g. building corrals) and providing a link between wildlife agency and community.*

## IMPORTANT ELEMENTS

- Selection of monitors
- Hold group meeting to incite action by individual and use self selection (LG, APW)
- Trial period before you hire the individuals is important (LG, APW)
- Can be selected based on the researchers needs, and skills (RME)
- Give jobs to people involved in lion killing (LG)
- Selected through community meetings with advice from leaders (TLP, SNWPC, NCP)
- Employ existing game scouts and train them (LWL)
- Clear definition of roles and responsibilities
- Must be sustainable source of funds to pay stipends or salaries
- Using enumerators (village leaders/teachers) to monitor data collection by individuals (RME)
- Perceptions by communities are very important - if the individuals also benefits it is more likely that they will be willing to help

## EFFECTIVENESS/PROS

- Works in some places, has potential in others, depends on the job and who you hire
- Makes community part of resolving human-lion conflict and conservation efforts, not researcher driven
- Can generate goodwill in community



Community livestock depredation monitors collecting information © African people and Wildlife fund

Lion guardian collecting information on lion movements © Lion Guardians

## LIMITATIONS TO APPLICABILITY/CONS

- Is very situation dependent, each area may need its own strategy
- May not be sustainable, requires ongoing funding
- At least initially requires constant outside management

## COST

- Medium to High
- Payment is usually needed, it is hard to get people to work for free, how much depends on nature of activity and how much you have

## EXTERNAL INPUT NEEDED

Requires external initiative, training, funding

## PROJECTS USING THE METHOD

LG, LWL, NR, RCP, RME, SNWPC, TLP, APW, NCP

# KEY INFORMANTS

## DESCRIPTION

*Using people within the community to inform you of issues related to conflict. Depending on the nature of the information provided, it is generally necessary for the individual to be anonymous to the community.*

## IMPORTANT ELEMENTS

- Person generally cannot be known by community (depends on information provided)
- Selected through local knowledge of the community
- If possible, management should not even know who the person is.
- Information needs to be constantly verified.
- Need at least two informers in an area to independently verify information.

## EFFECTIVENESS/PROS

- Can be effective but is very situation dependent, each area may need its own strategy
- Can be the only way to collect data on level of conflict and retaliatory killing

## LIMITATIONS TO APPLICABILITY/CONS

- Works in some places, has potential in others, depends on the job and who you hire
- Reliability of information can fall off over time and payment for information can lead to false information

## COST

- Payment should be very informal, more of a thank you, never directly from project

## EXTERNAL INPUT NEEDED

- External initiative, training, funding

## PROJECTS USING THE METHOD

- LG, NR, RCP, TLP, APW

# COMMUNITY OUTREACH / DISTRIBUTION MATERIALS

## DESCRIPTION

*Materials that are distributed throughout the community such as posters, leaflets and educational workbooks as a once off*

## IMPORTANT ELEMENTS

- Should involve target community in development of materials
- Must be locally relevant and if possible in local languages
- Should be accompanies by extension work / community outreach to explain
- Need versions for literate and illiterate people

## EFFECTIVENESS/PROS

- Can lead to important discussions and awareness of wildlife related issues and a greater understanding of local perceptions with increased tolerance.
- Youth education programs can lead to direct actions (watershed clean-ups, promotion of environmental regulations and greater community awareness).

## LIMITATIONS TO APPLICABILITY/CONS

- Effectiveness can be difficult to measure and should be part of a broader program.
- On their own without accompanying extension work unlikely to be successful
- Expensive

## COST

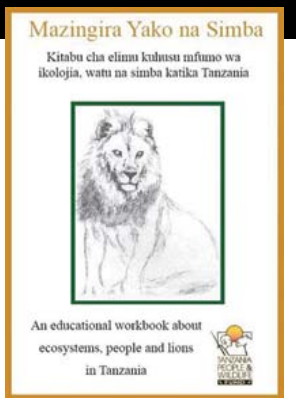
- Medium to High
- Variable, depends on type of materials and how they are distributed

## EXTERNAL INPUT NEEDED

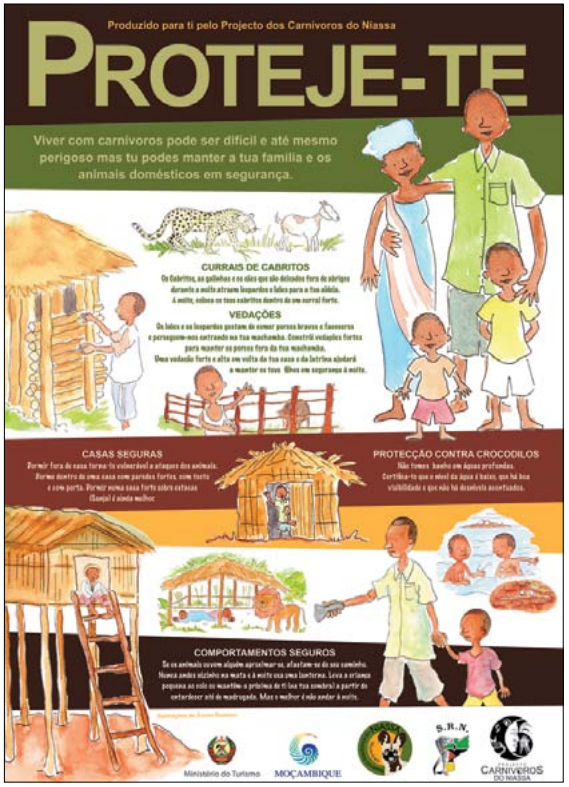
- Development of materials
- Printing and distribution of materials

## PROJECTS USING THE METHOD

NCP, NR, RCP, APW



*Outreach distribution Pamphlet © Ruaha Carnivore Project*



# INTERACTIVE ACTIVITIES

## DESCRIPTION

*Various outreach activities including community meetings, presentations, workshops, film shows, theatre groups, training programs, wildlife clubs, field trips, exchange programs*

## IMPORTANT ELEMENTS

- Should involve target community in development of materials
- Must identify target audience (children, adults, women?)
- Must be locally relevant
- Should work through teachers and/or through village leaders
- Need versions for literate and illiterate people
- Effectiveness should be assessed

## EFFECTIVENESS/PROS

- Can be very effective at transmitting information
- Can lead to important discussions and awareness of wildlife related issues, sharing of different perspectives and a greater understanding of local perceptions.
- Youth education programs can lead to direct actions.
- Can be seen a  positive benefit from conservation.

## LIMITATIONS TO APPLICABILITY/CONS

Can be difficult to measure/ quantify direct outcomes and ongoing input is needed.

## COST

- Medium to Very High
- Variable, depends on what, where, how but can be considerable

Lion Community play © Niassa Carnivore Project

## EXTERNAL INPUT NEEDED

Development of programs by educators

## PROJECTS USING THE METHOD

LG, LWL, NCP, NR, RCP, RME, SNWPC, TLP, APW

# OUTREACH IN SCHOOLS

## DESCRIPTION

*Any activities that involves outreach and education through formal education system in schools. Includes development of locally relevant curricula, lesson preparation, presentations, school outings, film shows, wildlife clubs, exchange programs, and educational workbooks*

## IMPORTANT ELEMENTS

- Must involve target community in development of materials
- Clear identification of target audience
- Must be locally relevant
- Working with teachers and relevant Education Departments

## EFFECTIVENESS/PROS

- Can lead to important discussions and awareness of wildlife related issues and a greater understanding of local perceptions.
- Builds goodwill for conservation
- Youth education activities can lead to direct actions
- Is sustainable if integrated into school curricula and if it includes teacher training

## LIMITATIONS TO APPLICABILITY/CONS

- Can be difficult to measure and quantify direct outcomes
- Input requires permission from relevant Education departments if it is to take place during school hours
- Need to be developed by educators.
- Only reaches school going children
- Cost
- Medium to Very High, depends on what, where, how

*Outreach in schools © African People & Wildlife Fund*

## EXTERNAL INPUT NEEDED

- Development of programs preferably with input from educators
- Teacher trianing

## PROJECTS USING THE METHOD

HLP, NCP, RCP, APW

# CONTACT DETAILS & CODES FOR RELEVANT ORGANIZATIONS & PROJECTS

| Project Abbreviation | Project / Organisation | Contact Name | Email |
|---|---|---|---|
| ALWG | African Lion Working Group | Sarel van der Merwe | mwnatura@gmail.com |
| LG | Lion Guardians | Leela Hazzah | glhazzah@gmail.com |
| LWL | Living with Lions | Alayne Cotterill | alayne.cotterill@gmail.com |
| NCP | Niassa Carnivore Project | Colleen Begg | ratel@iafrica.com |
| EL | Ewaso Lions | Shivani Bhalla | Shivani@ewasolions.org |
| NR | Niassa Reserve | Mbumba Marufo | mbumbamarufo@gmail.com |
| RCP | Ruaha Carnivore Project | Amy Dickman | amydickman.Gmail.com |
| RME | Rufiji Man-Eating Project | Hadas Kushnir | Kushn008@umn.edu |
| SNWPC | Selous-Niassa Wildlife protected Corridor | Wayne Lotter | wlotter@gauff.com |
| TLP | Tarangire Lion Project | Bernard Kissui | bkissui@awfafrica.org |
| APW | African People & Wildlife Fund | Charles Trout | trout@afrpw.org |
| Panthera | Panthera | Guy Balme | gbalme@panthera.org |
| CCB | Cheetah Conservation Botswana | Rebecca Klein | info@cheetahbotswana.com |
| CCF | Cheetah Conservation Fund | Laurie Marker | cheetah@iway.na |